REMARKS/ARGUMENTS:

Claims 1 through 14 remain in the application.

Claims 1 through 9 and 12 through 14 were rejected under 35 USC §103(a) as being unpatentable over Takahashi (JP01232156A) in view of Bolasny (3,878,469). Claims 10 and 11 were rejected under 35 USC §103(a) as being unpatentable over Takahashi (JP01232156A) in view of Bolasny (3,878,469) as applied to claims 1 through 9 and 13-14 above and further in view of Child, et al. (4,344,404). The Applicant respectfully traverses these rejections.

Japanese Patent 01232156A discloses an ionization device for internal combustion engine.

U.S. Patent No. 3,878,469 to Bolasny discloses a method and apparatus for producing ions at ultrasonic frequencies.

U.S. Patent No. 4,344,404 to Child, et al., discloses a fuel supply system.

In contradistinction, claim 1, as originally filed, claims a method for reducing emission and fuel consumption in order to improve combustion in internal combustion engines. In order to achieve a perfect combustion, prior to its entry into the combustion chamber of the internal combustion engine, a mixture of fuel and air is led through a treatment area characterized by specific physical properties provided by applying high voltage to the air stream and the fuel stream. The air stream will receive a charge of first polarity and the fuel stream a charge of opposite polarity. The method also includes vibrating at least one of the air and the fuel stream by a frequency in the ultrasonic range.

Takahashi '156 alone or in combination with Bolasny '469 or Child, et al., '404 does not disclose, teach, suggest or contemplate the present invention of claim 1. In particular, none of the references cited disclose a method wherein ultrasonic waves, as used by Applicant in his

methodology, has no role in the atomizing of the fuel. Furthermore, in the Applicant's invention the fuel is NOT ionized and as such the fuel is only electronically charged by the aid of the electrode or electrodes. Furthermore, the Applicant's methodology in the course of providing the fuel with the electronic charge has one or more of the electrodes excited with ultrasonic waves in order to repulse or remove the fuel molecules from the electrodes and to improve the material stream. These ultrasonic waves help both the air and fuel components of the present invention and such limitations are not disclosed, taught or suggested in any of the references cited by the Examiner. The lack of disclosure, suggestion or contemplation in either Takahashi, Bolasny or Child of such steps in the methodology claimed by the Applicant proves the inventive activity of the Applicant was essential to achieve the object of the invention. Furthermore, in the methodology claimed by the Applicant a continuous DC voltage is applied. The references only disclose applying an AC voltage or pulsing DC voltage in their systems. Also, the Applicant's claimed methodology includes the ultrasonic waves having a constant frequency and duty cycles such that there is no resonance cavity or hole and as such the piezo wafer and the electrode are in direct physical contact. These differences are clearly not shown in any of the prior art references and as such a combination of the prior art references cannot result in Applicant's claimed methodology of claim 1 and claimed equipment of claim 9.

Furthermore, it should be noted that the Takahashi reference only discloses a device for an internal combustion engine and nowhere in the reference, as enclosed in the office action, discloses a methodology reducing emission and fuel consumption in an internal combustion engine. It should further be noted that the Bolasny '469 reference could not be modified to perform the methodology as claimed by Applicant in independent claims 1 and 9. Specifically, the high volume of flowing air used by Applicant would make it extremely difficult to carry out

in practice the solution offered in the '469 patent which requires the ultrasonic excitation of the air stream. This ultrasonic generation is achieved in the '469 patent by streaming high pressure air which is hard to achieve and realize in internal combustion engines. Therefore, any such combination of the '469 reference and the Japanese '156 reference could only result in a system having an ultrasonic excitation of the fuel that is similar to the known ultrasonic flushing out apparatuses of the prior art. Any type of combination derived by these two prior art documents would have an apparatus that would require high powering energy, i.e., approximately several hundred watts and as such could not operate with the required efficiency, as the inputted power would be greater than the achieved consumption reduction. It should further be noted that any combination could not and would not result in Applicant's claimed methodology or equipment as claimed by the Applicant. Also, it should be noted that in the Applicant's methodology only the electrodes, which are delivering the electric charge, have to be excited thus requiring far less energy than having to excite the streaming fuel entering the internal combustion engine as the cited references require. The same arguments can also be applied to the air stream because the burning of fuel of approximately one kilogram requires a high air volume of approximately 15 kilograms, which in any combination of the '156 and '469 references would not be possible to realize and commercialize because although air is much easier to excite than any liquid, this would still require power of several hundred watts which leads to further inefficiencies of any system resulting from the combination of the '469 and '156 references.

It should also be noted that the Bolasny '469 reference only discloses, suggests or teaches the use of a resonant cavity type ultrasonic sound wave pulse generator in combination with an electric pulse ion generator. The main object of this known solution is producing and delivering ions to the point of use in a highly efficient manner. However, with such system there exists a

target which the apparatus shall be directed to, wherein the production of such ions is efficient but not the utilization of the treated gas stream. For increased quantities of ions the '469 reference utilizes the combination mentioned above. Furthermore, the Bolasny '469 reference rejects the use of an electric ultrasonic sound wave pulse generator and teaches exclusively to the use of the resonant cavity type generator. One skilled in the art could not realize the objects of the present invention as claimed by Applicant by combining the prior art references because the '469 reference specifically teaches away from Applicant's claimed invention and as such cannot be used as a §103 reference.

Therefore, because there is absolutely no teaching, suggestion or contemplation in any of the references cited of a methodology and apparatus as claimed by Applicant in independent claims 1 and 9, it is respectfully submitted that there is no conceivable combination of the Takahashi reference with any of the other cited references, Bolasny '469 or Child, et al., '404 to derive the Applicant's invention as claimed. Any such derivation from the Takahashi reference can only be made in hindsight after first reviewing Applicant's invention. The novel ideas of the Applicant cannot be inferred or inserted into the Takahashi reference from any other reference unless there is specific teaching or suggestion for such within the prior art. Therefore, the Takahashi '156 reference does not render Applicant's claim 1 or claim 8 obvious and as such this rejection is not proper and must fail. Furthermore, any combination of these documents could not lead to a useful or properly operating system such as that claimed by Applicant in claims 1 and 9.

The Applicant is also attaching at the end of this response official test results that the Applicant conducted in December of 2003, showing that the Applicant's claimed methodology results in a 41% reduction in consumption of fuel in the case of a fuel powered Otto engine and a

reduction of approximately 28% in the case of a gasoline powered diesel engine. These test results show that creating such efficiencies as found in Applicant's claimed methodology and apparatus clearly cannot be replicated in any type of system created by a combination of Takahashi with Bolasny or Child as claimed by the Examiner. This great improvement in the efficiency of the internal combustion engine when used with Applicant's apparatus and claimed methodologies clearly shows that Applicant has created a novel and not obvious methodology and apparatus that could not have resulted from the combination of the references cited by the Examiner. Therefore, it is respectfully submitted that claims 1 through 14 overcome these rejections under 35 USC §103(a) and are allowable over these rejections.

If the Applicant may be of any further assistance or provide any other information in the prosecution of this application, the Examiner is requested to contact the undersigned at (248) 364-2100.

Respectfully submitted,

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Dated: August 13, 2008